

### REMARKS

This responds to the Office Action mailed on May 18, 2007.

Claims 1-23 are now pending in this application. However, claims 1, 11, 21, 22 and 23 are withdrawn from consideration by the Examiner as a result of the restriction requirement. Claims 2, 3, 6, 12 and 15 are amended. In particular, the phrase “binary electrical, molecular or light data,” is now used instead of “binary digital data.” Support for subject matter relating to “binary electrical, molecular or light data” can be found throughout the specification as originally filed.

Applicant submits that these changes do not constitute new matter.

### *§112 Rejection of the Claims*

Claims 2-10 and 12-20 were rejected under 35 U.S.C. § 112, second paragraph, as allegedly indefinite in two respects.

Applicant submits that indefiniteness depends on whether one of skill in the art would understand the scope of the claim when the claim is read in light of the specification. *North American Vaccine Inc. v. American Cyanamid Co.*, 7 F.3d 1571, 28 USPQ2d 1333 (Fed. Cir. 1993). If the claims read in light of the specification reasonably apprise those skilled in the art of the scope of the invention, § 112 demands no more. *Miles Laboratories Inc. v. Shandon, Inc.*, 997 F.2d 870, 27 USPQ2d 1123 (Fed. Cir. 1993).

The alleged indefinite terminology is addressed separately below.

### **Stream of digital data**

The Examiner asserts that use of the phrase “stream of digital data” in claims 2 and 12 is indefinite because digital data is numerical information and it is allegedly unclear how numerical information can pass through a solid object such as a substrate.

The claims are now directed to a stream of binary molecular, electrical or light data. Applicant submits that this language is clear and definite, and that no further clarification is needed. Withdrawal of this rejection under 35 U.S.C. § 112, second paragraph, with respect to claims 2 and 12, and claims dependent thereon, is respectfully requested.

### A current of molecules

The Examiner asserts that use of the phrase “a current of molecules” in claims 6 and 15 is indefinite.

These claims are now directed to an array of molecules that can operate in a binary manner. Applicant submits that this language is clear and definite, and that no further clarification is needed. Withdrawal of this rejection under 35 U.S.C. § 112, second paragraph, with respect to claims 6 and 15, and claims dependent thereon, is respectfully requested.

### §102 Rejection of the Claims

Claims 2-10 and 12-20 have been rejected under 35 U.S.C. § 102(b) as allegedly anticipated by O’Keefe (US 2002/0004204 A1) in light of Berlien et al. (US 5,850,195). The Examiner alleges that O’Keefe teaches every element of claims 2-6, 8-10, 12-15 and 18-20, and that O’Keefe teaches the subject matter of claims 7, 16 and 17 as taught by Berlien.

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Accordingly, Applicant will treat the rejection as a rejection over O’Keefe, where the Berlien reference is used to clarify the subject matter of the O’Keefe reference.

In addition to a requirement that references cannot be combined to show anticipation, Applicant notes that the reference must show the identical invention in as complete detail as is contained in the claim. *Richardson v. Suzuki Motor Co.*, 868 F.2d 1226, 1236, 9 USPQ 2d 1913, 1920 (Fed. Cir. 1989). To constitute anticipation, the claimed subject matter must be identically disclosed in the prior art. *In re Arkley*, 172 U.S.P.Q. 524 at 526 (C.C.P.A. 1972). For anticipation, there must be no difference between the claimed invention and the reference disclosure, as viewed by a person of ordinary skill in the art. *Scripps Clinic & Res. Found. v. Genentech, Inc.*, 927 F.2d 1565, 18 USPQ2d 101 (Fed. Cir. 1991). To overcome the defense of anticipation, “it is only necessary for the patentee to show some tangible difference between the invention and the prior art.” *Del Mar Engineering Lab v. Physio-Tronics, Inc.*, 642 F.2d 1167, 1172, (9<sup>th</sup> Cir. 1981).

O'Keefe is limited to a conventional microarray superimposed over a conventional photodetector. Hence, the O'Keefe device detects interaction of molecules with the biopolymers of the microarray by detecting a difference in light absorption or emission from the biopolymer-binding partner complex – not from the substrate. The light signal received by the photodetector of O'Keefe is not a binary digital signal – instead the O'Keefe signal involves conventional light emission and/or absorption from the molecules stuck to the array. That fact that the term “binary” appears nowhere in the O'Keefe disclosure is evidence that the light detected by the O'Keefe photodetector is not digital data. Moreover, O'Keefe does not disclose a substrate that senses and transmits perturbations in a continuous binary molecular, electrical or light stream of information that is flowing through the substrate. Thus, the present invention is more like a computer chip through which binary digital data is transmitted and manipulated while the O'Keefe device is more like a microarray attached to a spectrometer.

Applicant submits that no one has previously described or contemplated a device comprising simply a substrate with one or more molecular species, where the substrate itself transmits digital data defining and identifying the molecular species on the substrate. Nor has anyone contemplated detection of molecular changes in, and interactions with, the molecular species on such substrate by directly monitoring digital information flowing through the substrate.

The Examiner recognizes that the optical signal generated by the molecules on the O'Keefe device is converted into digital data *after* detection by the photodetector (Office Action top of page 6). Thus, the Examiner tacitly acknowledges that the O'Keefe device requires additional materials and devices (photodetectors, light to digital data conversion devices, optically active reporting molecules on the biopolymers of the array or their binding partners, etc.). In contrast, one advantage provided by the present invention is that there is no need to convert analog information into digital information, thereby eliminating the need for several pieces of equipment and other materials, including reporting molecules that provide a detectable signal, analog signal detectors (like the photodetector described by O'Keefe), devices for converting analog signals into digital signals, etc. Therefore, the invention clearly provides an advance over the prior art.

Applicant submits that O'Keefe therefore fails to disclose at least the following elements of the claimed invention:

- creating at least one stream of binary electrical or light data;
- transferring the at least one stream of binary electrical or light data through a substrate; and
- receiving the streams of binary electrical or light data transferred through the substrate.

Moreover, the Berlien disclosure does not satisfy any deficiency of the O'Keefe reference or teach any element relevant to the present invention. Instead Berlien is limited to disclosure of a light-to-digital signal converter. While such a converter may be used by O'Keefe to convert an analog signal into a digital signal, no such analog-to-digital conversion is part of the present invention. Instead, the present invention uses a stream of digital data throughout the input and output steps of the present invention. Hence, the Berlien reference is irrelevant.

Applicant submits that claims 2-10 and 12-20 are novel and distinct over O'Keefe (US 2002/0004204 A1) in light of Berlien et al (US 5850195) and respectfully requests withdrawal of this rejection under 35 U.S.C. § 102(e).

### **CONCLUSION**

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (516) 795-6820 to facilitate prosecution of this application.

If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 19-0743.

### **Reservation of Rights**

In the interest of clarity and brevity, Applicant may not have addressed every assertion made in the Office Action. Applicant's silence regarding any such assertion does not constitute any admission or acquiescence. Applicant reserves all rights not exercised in connection with this response, such as the right to challenge or rebut any tacit or explicit characterization of any reference or of any of the present claims, the right to challenge or rebut any asserted factual or legal basis of any of the rejections, the right to swear behind any cited reference such as provided under 37 C.F.R. § 1.131 or otherwise, or the right to assert co-ownership of any cited reference. Applicant does not admit that any of the cited references or any other references of record are relevant to the present claims, or that they constitute prior art. To the extent that any rejection or assertion is based upon the Examiner's personal knowledge, rather than any objective evidence of record as manifested by a cited prior art reference, Applicant timely objects to such reliance on Official Notice, and reserves all rights to request that the Examiner provide a reference or affidavit in support of such assertion, as required by MPEP § 2144.03. Applicant reserves all rights to pursue any cancelled claims in a subsequent patent application claiming the benefit of

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priority of the present patent application, and to request rejoinder of any withdrawn claim, as required by MPEP § 821.04.

Respectfully submitted,

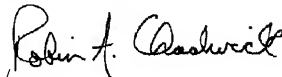
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**CERTIFICATE UNDER 37 CFR 1.8:** The undersigned hereby certifies that this correspondence is being filed using the USPTO's electronic filing system EFS-Web, and is addressed to: Commissioner of Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on this 20th day of August 2007.

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